STATEMENT OF WORK

Laboratory Analyses for the Neurotoxicology Division, National Health and Environmental Effects Research Laboratory, U.S. EPA, for Speciation of Methyltin Species in Water

This procurement is for the analysis of up to 96 samples of water containing either monomethyltin (MMT) or dimethyltin (DMT). Analysis of methyltin species (MMT, DMT, and trimethyltin [TMT]) as well as total tin will be required at specific time points after preparation of the water solutions, as specified below. The contractor shall provide EPA with a price for the full analysis of all 96 samples.

QUALITY ASSURANCE REQUIREMENTS

1. The contractor is required to submit a pre-award Quality Management Plan consistent with the specifications contained in document EPA/QAR-2 EPA Requirements for Quality Management Plans. No award may be given until and unless the Quality Assurance Manager and the Project Officer agree as to the conditions of that plan. EPA/QAR-2 can be downloaded from EPA's Quality Staff Home Page (http://www.epa.gov/quality) under "Documents".

2. The contractor is required to submit a Quality Assurance Project Plan consistent with the conditions of document EPA/QAR-5 EPA Requirements for Quality Assurance Project Plans. The QAPP must be submitted and approved by the QAM and the Project Officer prior to work beginning on the project but is not a pre-award condition. EPA/QAR-5 can be downloaded from EPA's Quality Staff Home Page (http://www.epa.gov/quality) under "Documents".

REQUIRED SERVICES

Contractor shall provide laboratory testing services to the Environmental Protection Agency ("EPA") in accordance with the Description of Services. Services are to be performed in accordance with this Statement of Work and coordinated with the designated EPA Project Officer.

TIME OF COMPLETION

Specimens are to be collected by the EPA, and the Contractor shall arrange for shipment. Due to the uncertain stability of the compounds, the samples must be picked up within 15 minutes of preparation in the EPA laboratory, and analysis or stabilization (for later analysis) made within 30 minutes. The actual specimen collections will take place over one week. To allow for analysis verification and post-collection analyses, the period of performance is 12 months from the date the contract is awarded.

KEY PERSONNEL

The Contractor shall designate a Study Manager and provide contact information (telephone, email, postal address). The Study Manager shall coordinate communications between EPA and the Contractor analytical laboratory, supply necessary forms, and oversee execution of performance for the Contractor.

The EPA Project Officer, Dr. G. Moser, will be responsible for coordinating performance with the Contractor. Other EPA key personnel will be Ms. Kathy McDaniel, and Ms. Pam Phillips of the Neurotoxicology Division, NHEERL.

PUBLICATION AND OWNERSHIP OF METHODOLOGY

EPA reserves the right to publish in the open, peer-reviewed scientific literature any and all of the data collected in the course of this contract. Tests and methods developed and validated by Contractor shall supply sufficient experimental detail regarding analysis methods to enable its publication in this literature. Any new analysis methods or techniques developed by Contractor in the course of this contract shall remain the property of Contractor unless otherwise specified. No data will be released in any publication without prior written approval of the EPA.

DESCRIPTION OF SERVICES

Analysis of the organotin concentrations (total tin and methyltin species) in drinking water studies is needed to verify dose levels used in animal studies. Stability of two organotin compounds, monomethyl and dimethyl tin, will be measured over several days, under conditions of use equivalent to the animal study. There will be a stock solution which will be kept in the freezer, and dilutions made from that stock will be kept in water bottles in the animal room, suspended on empty cages. For each solution, analysis shall be conducted immediately after preparation, 6 hours later, and again at 1, 2, 3, and 4 days, to allow a time-course for stability. Samples of the stock will be analyzed immediately after preparation and at 2 and 4 days. Analysis at each time point shall include actual quantity of monomethyl (MMT), dimethyl (DMT), and trimethyl tin (TMT), as well as total tin (Sn). The solutions will be made on a Monday, and sampling will take place each day (Friday=day 4) that week.

The Contractor is free to choose the analytical method most appropriate for this contract. Literature citations for this type of analysis are included in References. However, the methodology must be capable of identifying and quantifying the methyltin species at relatively low concentrations (limits of detection no more than 0.1% of nominal concentrations). Recommended methods include LC or GC (requiring derivitization) followed by MS identification of species. Numerous papers in the literature describe these methodologies (cited below). In addition, SOPs for GC/MS analysis are available from the EPA. The Contractor must fully describe the proposed analytical techniques with supporting documentation of capabilities and anticipated recovery/limits of detection.

All solutions will be maintained at the EPA's Environmental Research Center laboratory in Research Triangle Park, NC. Water samples shall be picked up from the EPA facility by the Contractor or courier, and delivered to the Contractor's laboratory where the assays will be performed. Contractor shall perform the assays, verify the accuracy of the results with concurrent standard curves and control samples, and report the results, including data from which the standard curves are derived, to the EPA in writing and electronically in the form of a PC-based spreadsheet (e.g., Excel®) or ASCII file.

1. Initial recovery / feasibility studies.
Contractor shall undertake feasibility studies to determine recovery of methyltin species in spiked water solutions. Recovery will be reported to EPA prior to shipping samples with unknown concentrations.

2. Stability study of water solutions
Solutions and sampling times are listed in the table below. Contractor shall work with EPA to determine the appropriate sample size for each sample. Contractor shall provide bottles for sample collection in consultation with EPA. This actual collection of samples will take 1 week.

Sample	Dose	Sampling time points						# samples
		immediately (Mon)	6 hr (Mon)	1 day (Tues)	2 day (Wed)	3 day (Thurs)	4 day (Fri)	
MMT stock	24.5 mg/ml	X			X		X	3
DMT stock	7.4 mg/ml	X			X		X	3
High MMT dose (3 bottles)	0.245 mg/ml	X	X	X	X	X	X	18
Low MMT dose (3 bottles)	0.01 mg/ml	X	X	X	X	X	X	18
High DMT dose (3 bottles)	0.074 mg/ml	X	X	X	X	X	X	18
Low DMT dose (3 bottles)	0.003 mg/ml	X	X	X	X	X	X	18
Control (deionized water; 3 bottles)	0	X	X	X	X	X	X	18
Total samples								96

3. Contractor shall perform analysis for concentrations of MMT, DMT, TMT, and total tin in each water sample.

4. EPA will work with the Contractor to schedule the stability study as described above.

5. The assays shall be conducted within 30 minutes of receipt at the analytical laboratory. Alternatively, the samples may be stabilized immediately for later analysis. Final analysis shall be conducted within 2 weeks and results of the assays shall be reported by Contractor to the EPA project officer. The results shall include:

a. Values obtained for the recovery and quantitation of methyltin species, including limits of detection.

b. A table listing the water sample number and the calculated concentration of each methyltin and total tin in mg/L, as well as results of control samples run in the analytical laboratory for verification of accuracy of the assay.

6. A total of 96 samples will be provided in this study.

7. Contractor shall submit an invoice to the EPA after the samples have been assayed.

REFERENCES

Jones-Lepp, T.L., Varner, K.E., McDaniel, M., Riddick, L. (1999) Appl. Organometal. Chem. 13:1-9.

Takeuchi, MN., Mizuishi, K., Hobo, T. (2000) Anal. Sci. 16:349-359.

Gonzalez-Toledo, E., Campano, R., Granados, M., Prat, M.D. (2003) Trends Anal. Chem. 22:26-33.

Harrington, C.F., Eigendorf, G.K., Cullen, W.R. (1996) Appl. Organomet. Chem. 10:339-

Ebdon, L., Hill, S.J., Rivas, C. (1998) Trends Anal. Chem. 17:277-288

Dauchy, X., Astruc, A., Borsier, M., Astruc, M. (1992) Analysis 20:41-